If you are using a printed copy of this procedure, and not the on-screen version, then you <u>MUST</u> make sure the dates at the bottom of the printed copy and the on-screen version match.

The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.

Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ

Training Office, Bldg. 911A.

C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

4.120.13.e WXY (PEER 5) MODE 24 TESTS

C-A-OPM Procedures in which this Attachment is used.								
4.120.13								

Hand Processed Changes

HPC No.	<u>Date</u>	Page Nos	s. <u>Initials</u>	
			_	
	Approved:	Signature on	Fil e	
		Collider-Accelerator De		Date

V. Castillo

4.120.13.e WXY (PEER 5) Mode 24 Tests

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:
Division B Software Filename and Checksum: Title:	Checksum:
Initial testing complete:	
initial testing complete:	
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
Test Team Deader 5 Ivanic (Sign).	Datc/
Acceptance test procedure complete (following repairs and retesting if required):	
	Y 16 N
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
<u>Test results reviewed by:</u>	
Safety Section Head's Name (Print):	Life Number:
Safety Section Head's Name (Sign):	Date://
Safety Section Head's Name (Sign).	Date:/
<u>Test results accepted by Radiation Safety Committee</u> :	
RSC Member's Name (Print):	Life Number:
RSC Member's Name (Sign):	Date:/

1.1 Verify necessary conditions for Mode 24

	PLACE VERIFY	Peer 5 in Mode 16 Peer 5 is in Controlled Access	MODE 16
	RESET VERIFY	Peer 5 gates: WGE1, XGI1, XGI2, YGI1, YGI2 and WGE2 Peer 5 gates: □ WGE1, □ XGI1, □ XGI2, □ YGI1, □ YGI2, and	DECEM
	SWEEP	☐ WGE2 are Peer 5 Zones: W, X and Y, leaving one Personnel in Zone W	RESET
	VERIFY	Peer 5 Zones: \Box W, \Box X and \Box Y are	SWEEP OK
	PLACE VERIFY RECORD	Peer 5 in Mode 24 Peer 5 is in No Access Duration [secs] of Beam Imminent Alarm	MODE 24
	VERIFY	Red No Access Light at Gates: □ WGE1, □ WGE2 is	ON
	PLACE VERIFY	Peer 5 in Mode 16 Peer 5 is in Controlled Access	MODE 16
	REMOVE VERIFY	Reset from gate WGE2 MCR sees gate WGE2 is	CLOSED
	PLACE VERIFY	Peer 5 in Mode 24 Attempt to place Peer 5 in No Access Mode	FAIL
	RESET VERIFY	Gate WGE2 MCR sees gate WGE2	RESET
_	PLACE	Peer 5 in Mode 24	
	VERIFY	MCR sees Peer 5 in No Access	MODE 24
	PLACE VERIFY	Peer 5 in Mode 16 Peer 5 is in Controlled Access	MODE 16
	REMOVE VERIFY	Sweep from zone X MCR sees zone X is	NO SWEEP
	PLACE VERIFY	Peer 5 in Mode 24 Attempt to place Peer 5 in No Access Mode	FAIL
	SWEEP VERIFY	Zone X MCR sees zone X	SWEEP OK
_	PLACE	Peer 5 in Mode 24	
	VERIFY PLACE	MCR sees Peer 5 in No Access Peer 5 in Mode 16	MODE 24
			MODE 16
	VERIFY	Peer 5 is in Controlled Access	MODE 16
П	REMOVE	Sweep from zone Y	
		Sweep from zone Y MCR sees zone Y is Peer 5 in Mode 24	NO SWEEP
	REMOVE VERIFY PLACE VERIFY	Sweep from zone Y MCR sees zone Y is Peer 5 in Mode 24 Attempt to place Peer 5 in No Access Mode	
_	REMOVE VERIFY PLACE	Sweep from zone Y MCR sees zone Y is Peer 5 in Mode 24	NO SWEEP
	REMOVE VERIFY PLACE VERIFY SWEEP VERIFY PLACE	Sweep from zone Y MCR sees zone Y is Peer 5 in Mode 24 Attempt to place Peer 5 in No Access Mode Zone Y MCR sees zone Y Peer 5 in Mode 24	NO SWEEP FAIL SWEEP OK
	REMOVE VERIFY PLACE VERIFY SWEEP VERIFY PLACE VERIFY	Sweep from zone Y MCR sees zone Y is Peer 5 in Mode 24 Attempt to place Peer 5 in No Access Mode Zone Y MCR sees zone Y Peer 5 in Mode 24 MCR sees Peer 5 in No Access	NO SWEEP
	REMOVE VERIFY PLACE VERIFY SWEEP VERIFY PLACE	Sweep from zone Y MCR sees zone Y is Peer 5 in Mode 24 Attempt to place Peer 5 in No Access Mode Zone Y MCR sees zone Y Peer 5 in Mode 24	NO SWEEP FAIL SWEEP OK

1.2 Verify System Response to Opening a Gate while in Mode 24

VERIFY VERIFY	CD Key Switch is set for Peer 5 is in Controlled Access	XY ARC MODE 16
SET VERIFY	RHIC Primary Beam Stop Withdraw Cmd button in MCR MCR sees RHIC Primary Beam Stop Withdraw Cmd	IN IN
VERIFY VERIFY VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3) MCR sees Peer 5 Div A □ and Div B □ ATR inh (for 8° & 20°) MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth MCR sees Peer 5 Div A Rhic Ring inh (BS 1,2) MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	DISABLED OFF OFF ON OFF OFF
PLACE VERIFY WAIT	Peer 5 in Mode 24 MCR sees Peer 5 in No Access For Beam Imminent Alarm to stop sounding	MODE 24
VERIFY VERIFY VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3) MCR sees Peer 5 Div A □ and Div B □ ATR inh (for 8° & 20°) MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth MCR sees Peer 5 Div A Rhic Ring inh (BS 1,2) MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	ENABLED OFF OFF OFF OFF OFF
SET VERIFY	RHIC Primary Beam Stop Withdraw Cmd button in MCR MCR sees RHIC Primary Beam Stop Withdraw Cmd	OUT OUT
VERIFY FOLLOW	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2) Test schedule in Table 1, below	OFF

Open Gate	Verify peer 5 goes to Mode 2	Verify local sweep: W,X,Y is lost	Verify RHIC Inj CD Disab	Verify Div A & B for ATR inh, 8°, 20° ON	Verify Div A & B inh for RHIC BS 1,2 ON	Place peer 5 in Mode 24 & Alarm stop	Verify RHIC Inj CD Enab	Verify Div A & B for ATR inh, 8°, 20° OFF	Verify RHIC BS wdraw cmd OUT	Verify Div A & B inh for RHIC BS 1,2 OFF	Go to next gate
XGI1											
WGE2											
YGI2											End of test

Table 1- Test of Gates in Mode 24

☐ Check for acceptance of Verify System Response to Opening a Gate while in Mode 24

1.3	Verify Entry g	ates are securely locked in Mode 24	
	PLACE VERIFY WAIT	Peer 5 in Mode 24 MCR sees Peer 5 in No Access For Beam Imminent Alarm to stop sounding	MODE 24
	OPEN	Gate WGE2 with #10 RC CA Key and Simultaneous Release Attempt to open gate WGE2 with #10 RC CA Key and Sim. Rel. Gate WGE2 with #11 RC Sweep Key and Simultaneous Release	FAIL
	OPEN	Attempt to open gate WGE2 with #11 RC Sweep Key and Sim. Rel. Gate WGE2 with Blue Card	FAIL
		Attempt to open gate WGE2 with Blue Card	FAIL
	☐ Check fo	or acceptance of Verify Entry gates are securely locked in Mode 24	
1.4	Varify Systam 1	Response to Pulling a Crash Cord while in Mode 24	
1.4	Test of Zone	•	
		CD Key Switch is set for	XY ARC
	PLACE VERIFY	Peer 5 in Mode 24 MCR sees Peer 5 in No Access	MODE 24
	WAIT	For Beam Imminent Alarm to stop sounding	
	VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3) MCR sees Peer 5 Div A □ and Div B □ ATR inh (for 8° & 20°) MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth MCR sees Peer 5 Div A Rhic Ring inh (BS 1,2) MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	ENABLED OFF OFF OFF OFF ON
	SET VERIFY	RHIC Primary Beam Stop Withdraw Cmd button in MCR MCR sees RHIC Primary Beam Stop Withdraw Cmd	OUT OUT
	VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	OFF
	PULL	Any Zone X crash cord [System #:]	
	T.T.D.T.D.T.	Peer 5 goes to Sweep is	MODE 2 LOST
	VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3) MCR sees Peer 5 Div A □ and Div B □ ATR inh (for 8° & 20°) MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth MCR sees Peer 5 Div A □ and Div B □ Rhic Ring inh (BS 1,2)	DISABLED OFF OFF ON OFF ON
	REARM	Crash device	D
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П	RESET VERIFY	Crash at MCR Crash is	RESET
	PLACE VERIFY	Peer 5 in Mode 24 Peer 5 is in Beam Imminent Mode	MODE 24
	V EKIF I	Feer 5 is in beam imminent wiode	MODE 24
	PULL	Any Zone X crash cord [System #:] when alarm	1
		starts sounding	
	VERIFY	Beam Imminent alarm	STOPS
	VERIFY	Peer 5 has moved to	MODE 2
	VERIFY	MCR sees Zone X	CRASHED
	PLACE	Peer 5 in Mode 8 (Restricted Access)	
	VERIFY	Attempt to go to Mode 8	FAIL
	REARM	Crash device	
	RESET	Crash at MCR	
	VERIFY	Crash is	RESET
_	PLACE VERIFY	Peer 5 in Mode 8 MCR sees Peer 5 in Restricted Access	MODE 8
	VEKIF I	WCR sees Feer 5 III Restricted Access	MODE 8
	Test of Zone	\mathbf{v}	
_	PLACE	Peer 5 in Mode 24	MODEAL
	VERIFY	MCR sees Peer 5 in No Access	MODE 24
	DITT	Ann Zone Wangsh and I Sustan #	_
	PULL	Any Zone Y crash cord [System #:] when alarm starts sounding	l
		star is sounding	
	VERIFY	Beam Imminent alarm	STOPS
	VERIFY	Peer 5 has moved to	MODE 2
	VERIFY	MCR sees Zone Y	CRASHED
	PLACE	Peer 5 in Mode 8 (Restricted Access)	
	VERIFY	Attempt to go to Mode 8	FAIL
	REARM	Crash device Crash at MCR	
	RESET VERIFY	Crash is	RESET
ш	PLACE	Peer 5 in Mode 8	KESE I
	VERIFY	MCR sees Peer 5 in Restricted Access	MODE 8
	Check f	or acceptance of Verify System Response to Pulling a Crash Cord v	while in Mode 24
Tes	t Division A l	oss of Remote I/O in Mode 24	
	VERIFY	CD Key Switch is set for	XY ARC
	VERIFY	MCR sees Peer 5 in No Access	MODE 24
	VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page	ENABLED
	VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth	OFF
	VERIFY	MCR sees Peer 5 Div A \square and Div B \square Rhic Rhbk Lth (BS 3)	OFF
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		VERIFY VERIFY	MCR sees Peer 5 Div A □ and Div B □ ATR inh (for 8° & 20°) MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth	OFF OFF
		VERIFY	MCR sees Peer 5 Div A Rhic Ring inh (BS 1,2)	OFF
	П	VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	ON
	П	VERIT I	WICK Sees Feel 5 DIV D Kille Killg IIII (D5 1,2)	ON
		SET	RHIC Primary Beam Stop Withdraw Cmd button in MCR	OUT
		VERIFY	MCR sees RHIC Primary Beam Stop Withdraw Cmd	OUT
		, 22122 2		001
		VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	OFF
		UNPLUG	Remote I/O cable from Scanner module in Peer 5A	
		WAIT REPLACE	30 secs Remote I/O cable at Scanner module in Peer 5A	
		T/EDIDI	MCD D FD: A CL DVO MAN	TO A T. IT (TO)
		VERIFY	MCR sees Peer 5 Div A Cdev RI/O on H/W page	FAULT
		VERIFY	MCR sees Peer 5 Div A on Mtce Status page	MODE 2
		VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page	$A \neq B$
		VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth	OFF
		VERIFY	MCR sees Peer 5 Div A Rhic Rhbk Lth (BS 3)	ON
		VERIFY	MCR sees Peer 5 Div A ATR inh (for 8° & 20°)	ON
		VERIFY	MCR sees Peer 5 Div A ATR Rhbk Lth	ON
		VERIFY	MCR sees Peer 5 Div A Rhic Ring inh (BS 1 & 2)	ON
		VERIFY	MCR sees Peer 5 AGS Rchbk	Reachback
		VERIFY	MCR sees Peer 5 RHIC Rchbk	Reachback
		RESET	Cdev RIO FAULT at MCR	
		VERIFY	MCR sees Cdev RIO	OK
	Ц	VEXIT 1	MCK SCCS CUEV KIO	OK
		RESET	Reachbacks	
		VERIFY	MCR sees Peer 5 AGS Rchbk	Reachback OK
	П	VERIFY	MCR sees Peer 5 RHIC Rchbk	Reachback OK
	_			
		PLACE	Peer 5 in Mode 2	
		VERIFY	MCR sees Peer 5 in Safe Access	MODE 2
		Check	for acceptance of Test Division A loss of Remote I/O in Mode 24	
1.6	Tes	t Division B lo	ss of Remote I/O in Mode 24	
		VERIFY	CD Key Switch is set for	XY ARC
		PLACE	Peer 5 in Mode 16	
		VERIFY	MCR sees Peer 5 in Controlled Access	MODE 16
		PLACE	Peer 5 in Mode 24	
		VERIFY	MCR sees Peer 5 in No Access	MODE 24
		VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page	ENABLED
<i>~</i> ,	_			
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VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth	OFF						
VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3)	OFF						
VERIFY	MCR sees Peer 5 Div A \square and Div B \square ATR inh (for 8° & 20°)	OFF						
VERIFY	MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth	OFF						
VERIFY	MCR sees Peer 5 Div A Rhic Ring inh (BS 1,2)	OFF						
VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	ON						
SET	RHIC Primary Beam Stop Withdraw Cmd button in MCR	OUT						
VERIFY	MCR sees RHIC Primary Beam Stop Withdraw Cmd	OUT						
VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	OFF						
UNPLUG WAIT	Remote I/O cable from Scanner module in Peer 5B 30 secs							
REPLACE	Remote I/O cable at Scanner module in Peer 5B							
VERIFY	MCR sees Cdev RIO on H/W page	FAULT						
VERIFY	MCR sees Peer 5 Div B go to	MODE 2						
,	2020 3000 2002 0 227 2 80 00	1110222						
VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page	$A \neq B$						
VERIFY	MCR sees Peer 5 Div B Rhic Inj Rhbk Lth	ON						
VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3)	OFF						
VERIFY	MCR sees Peer 5 Div B ATR inh (for 8° & 20°)	ON						
VERIFY	MCR sees Peer 5 Div B ATR Rhbk Lth	ON						
VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1 & 2)	ON						
VERIFY	MCR sees Peer 5 AGS Rchbk	Reachback						
VERIFY	MCR sees Peer 5 W Rchbk	Reachback						
VERIFY	MCR sees Peer 5 RHIC Rchbk	Reachback						
VERIFY	MCR sees RHIC G3 BS	IN						
RESET	Cdev RIO FAULT at MCR							
VERIFY	MCR sees Cdev RIO on H/W page	OK						
RESET	Reachbacks							
VERIFY	MCR sees Peer 5 AGS Rchbk	Reachback OK						
VERIFY	MCR sees Peer 5 W Rchbk	Reachback OK						
VERIFY	MCR sees Peer 5 RHIC Rchbk	Reachback OK						
VERIFY	MCR sees RHIC G3 BS	OUT						
PLACE	Peer 5 in Mode 2							
VERIFY	MCR sees Peer 5 in Safe Access	MODE 2						
PLACE	Peer 5 in Mode 8							
VERIFY	MCR sees Peer 5 in Restricted Access	MODE 8						
☐ Check for acceptance of Test Division B loss of Remote I/O in Mode 24								

1.7 Chipmunk Tests in Mode 24

VERIFY	CD Switch is set for	XY ARC
ATTACH RESET VERIFY	Test Box to Chipmunk prior to test Chipmunk alarms MCR sees Chipmunk alarms	RESET
PLACE VERIFY WAIT	Peer 5 in Mode 24 MCR sees Peer 5 in No Access For Beam Imminent Alarm to stop sounding	MODE 24
VERIFY	MCR sees RHIC Injection CDs (U, W) on CD page	ENABLED
VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Inj Rhbk Lth	OFF
VERIFY	MCR sees Peer 5 Div A □ and Div B □ Rhic Rhbk Lth (BS 3)	OFF
VERIFY	MCR sees Peer 5 Div A \square and Div B \square ATR inh (for 8° & 20°)	OFF
VERIFY	MCR sees Peer 5 Div A □ and Div B □ ATR Rhbk Lth	OFF
VERIFY	MCR sees Peer 5 Div A Rhic Ring inh (BS 1,2)	OFF
VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	ON
SET	RHIC Primary Beam Stop Withdraw Cmd button in MCR	OUT
VERIFY	MCR sees RHIC Primary Beam Stop Withdraw Cmd	OUT
VERIFY	MCR sees Peer 5 Div B Rhic Ring inh (BS 1,2)	OFF
FOLLOW	Tests in Tables 5, 6, 7 and 8 below	

C'munk	Press & verify div A trip	Verify Peer 5 stays in mode 24	Verify div A Rhic Inj CD Disab	Verify div A & B Rhic ring inh OFF	Verify div A ATR inh ON	Reset & verify all systems reset	Verify Prim BS Cmd is OUT	Verify div A & B Rhic Inj CD Enab	Verify div A & B RHIC ring inh OFF	Verify div A & B ATR inh OFF	Goto table 8 for div B trip
C16											
C17											
C18											

Table 5 – Division A trip test in Mode 24

C'munk	Press & verify div B trip	Verify Peer 5 stays in mode 24	Verify div B Rhic Inj CD Disab	Verify div A & B Rhic ring inh OFF	Verify div B ATR inh ON	Reset & verify all systems reset	Verify Prim BS Cmd is OUT	Verify div A & B Rhic Inj CD Enab	Verify div A & B RHIC ring inh OFF	Verify div A & B ATR inh OFF	Goto table 7 for div A Fail
C16											
C17											
C18											

Table 6 – Division B Trip test in Mode 24

Cmk	Press & verify div A fails	Verify Peer 5 div A goes to mode 2	Verify Rhic Inj CD Disab	Verify div A Rhic ring inh OFF	Verify div A ATR inh ON	Reset & verify all systms reset	Place Peer 5 in mode 24 & alarm stop	Verify Prim BS Cmd is OUT	Verify div A & B Rhic Inj CD Enab	Verify div A & B RHIC ring inh OFF	Verify div A & B ATR inh OFF	Goto table 8 for div B Fail
C16												
C17							·					
C18												

Table 7 - Division A Fails test in Mode 24

Cmk	Press & verify div B fails	Verify Peer 5 div B goes to mode 2	Verify Rhic Inj CD Disab	Verify div B Rhic ring inh OFF	Verify div B ATR inh ON	Reset & verify all systms reset	Place Peer 5 in mode 24 & alarm stop	Verify Prim BS Cmd is OUT	Verify div A & B Rhic Inj CD Enab	Verify div A & B RHIC ring inh OFF	Verify div A & B ATR inh OFF	See end of test instrns below
C16												
C17												
C18												

Table 8 - Division B Fails test in Mode 24

End of Test Instructions:

DETACH Test Box from Chipmunk after test

CONNECT Cable to Chipmunk
RESET Chipmunk faults at MCR

VERIFY MCR sees Chipmunk

•

ATTACH Test Box to next Chipmunk and go to start of test "ATTACH..." or

END Chipmunk test

PLACE Peer 5 in Mode 8

□ VERIFY MCR sees Peer 5 in Restricted Access MODE 8

☐ Check for acceptance of Chipmunk Tests in Mode 24

OK

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing:	
	Date://
TTL: Sign for completion of final testing:	
	Date: / /